Patients underwent scintigraphy two, six, and 24 hours after taking 200 MBq of ^{99m}Tc-sucralfate orally with 500 ml of mannitol (the procedure described by Dawson *et al*[2] Ten of our patients underwent a double contrast barium enema roughly 72 hours after the scan, and the other patient underwent a pancolectomy four days after the scan. Scans were reported on independently by two nuclear physicians, the barium studies by the same consultant radiologist. Each observer drew on a picture of a colon the areas they believed to be abnormal, and a histopathologist did likewise for the colectomy specimen.

The results showed very poor concordance between the two physicians reporting on the same scans by the criteria of Dawson *et al*. There was also poor agreement between the scintiscans and radiology and histology as to the extent of disease. In general, scans suggested more right sided colonic disease than the barium studies, probably owing to labelling of faecal material proximal to the inflamed mucosa.

Two other features led us to abandon this procedure; even after 24 hours scan appearances could change considerably from one minute to the next, and patients, when questioned, said that they found the length of the procedure and the effects of the mannitol more distressing than a barium enema.

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1 Crump BJ, Field S, Rake MO, Kettle AG, Buxton-Thomas MS, Coakley AJ. ^{99m}Tc-Sucralfate imaging in inflammatory bowel disease—poor correlation with radiology. *Nuclear Medicine Communications* 1987:8:273.
2 Dawson DJ, Khan AB, Miller V, Ratcliffe JF, Shreeve DR. Detection of inflammatory bowel disease in adults and children: evaluation of a new isotopic technique. *Br Med J* 1985;**291**: 1227-30.

SIR,—The findings of Mr A George and colleagues (5 September, p 578) disagree with those of Dawson *et al*,[1] whose work also stimulated us to assess sucralfate in imaging colonic disease.

We studied eight patients with right sided colonic carcinoma, a common disease in elderly patients, in whom barium enema examination is often poorly tolerated and consequently may not provide satisfactory imaging of the right colon. A bowel preparation of 500 ml 10% mannitol solution followed by orthograde lavage with saline was used on the day before the study. For imaging we used ^{111}In sucralfate and ^{99}Tc HIDA as a faecal marker. The vast bulk of imaged activity was in the intraluminal contents held up proximally to the tumours, and after subtraction of Tc labelled faecal material the tumour itself could be visualised in only one patient. The patients all underwent right hemicolectomy the day after the study, and the specimens were imaged on a gammacamera before and after luminal lavage. The tumour usually appeared as a cold spot between levels of high activity, which disappeared after lavage of the intraluminal contents. The ulcerated surface of the tumour did, however, bind the sucralfate to a greater extent than normal mucosa (median ratio 3:2).

While the tumour:mucosal ratios offer some hope for sucralfate in imaging ulcerating colonic lesions, our results show that sucralfate attaches predominantly to faecal contents. George and colleagues postulated that failure of sucralfate to stick to ulcers might be due to not using mannitol in bowel preparation, but our results contradict this view. We were unable to develop a reliable method even though we used a variety of bowel stimulants and purgatives to promote the passage of the intraluminal contents past the lesion.

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1 Dawson DJ, Khan AN, Miller V, Ratcliffe JF, Shreeve DR. Detection of inflammatory bowel disease in adults and children: evaluation of a new isotopic technique. *Br Med J* 1985;**291**: 1227-30.

SIR,—We share the disappointment of Mr A George and colleagues, whose scintigraphic imaging with ^{99m}Tc sucralfate failed to reflect the extent or activity of known colonic inflammatory bowel disease.

Using the methods of Dawson *et al*,[1] but omitting the rectal washout, we imaged two patients with extensive ulcerative colitis and 11 with colonic or ileocolonic Crohn's disease, with serial images taken up to 30 hours after ingestion of ^{99m}Tc sucralfate. When compared with the accompanying barium studies and histological findings from six patients who had resections within two to eight weeks of radionuclide imaging scintigraphy underestimated or mislocated active disease in 12 patients; the remaining patient, who had pancolitis, showed diffuse persistent radioactivity throughout the colon. Eight of our patients ingested mannitol and five did not. Results were no better in the mannitol group.

Gastric retention of labelled sucralfate adherent to mucosa has been documented.[2] This was a major nuisance in seven patients, occurring beyond five hours despite the administration of metoclopramide and exhortations to drink water freely after 30 minutes. The subsequent delayed passage of radioactivity through the gut caused problems with image interpretation.

Disruption of the ^{99m}Tc sucralfate complex, indicated by a faint thyroid and salivary gland image, was generally insufficient to be troublesome. However, the appearance of a gastric image by 23 hours in four patients, including the one with a "true positive" result, was accompanied by a potentially misleading second passage of radioactivity through the gut. The improved stability of sucralfate labelled with ^{99m}Tc DTPA[3] prompted its use for a further patient with ileocolonic Crohn's disease. Although thyroid and delayed gastric images were absent, scintigraphy still correlated poorly with barium studies and histology. Bound gastric radioactivity was retained up to six hours.

Thus our experience is similar to that of Mr George and colleagues and suggests that ^{99m}Tc sucralfate scintigraphy is unreliable for assessing inflammatory bowel disease.

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1 Dawson DJ, Khan AN, Miller V, Ratcliffe JF, Shreeve DR. Detection of inflammatory bowel disease in adults and children: evaluation of a new isotopic technique. *Br Med J* 1985;**291**:1227-30.
2 Carstens AJ, Iturralde M, Fourie PA, Van Wyk A, Pilloy W. Radionuclide studies in upper gastro-intestinal ulceration—are they reliable? *S Afr Med J* 1985;**68**:867-8.
3 Centi Colella A, Scoparino F. Peptic ulcer imaging by ^{99m}Tc-Sucrolfate and possible advantages of ^{99m}Tc-Sucrose octasulfate. *J Nucl Med Allied Sci* 1985;**29**:192-3.

SIR,—Mr A George and colleagues (5 September, p 578) have had disappointing results using technetium labelled sucralfate to show colonic disease compared with colonoscopy. They question whether their experience, which contrasts with our own, relates to our use of mannitol, which might favourably affect the colonic pH. Their explanation may well be correct in spite of the fact that they then go on to argue that the alteration of pH produced by the fermentation of mannitol is not likely to be very great. In practice, however, it may be great enough. A further explanation may be that the use of Picolax produces such pronounced intestinal hurry that adhesions to inflamed areas with sucralfate do not occur. Certainly, our paediatric experience using sucralfate to label duodenal ulcers was disappointing, and we had presumed that this was related to transit time.

We should not be surprised that sucralfate is less satisfactory at picking up mucosal lesions than colonoscopy. Colonoscopy is generally accepted to be the investigation of choice for colonic disease.[1] Certainly, colonoscopy and biopsy will produce a higher yield of disease than, for example, double contrast barium enema, which has generally been regarded as the gold standard of radiological examination of the colon.

We have now had considerably more experience with this technique and are re-examining our results. The particular advantages of this technique seem to be that it provides a simple screening test, which is fairly non-invasive and helps to support a clinical diagnosis of inflammatory bowel disease. It also indicates which is likely to be the next major investigation—small bowel enema or colonoscopy. The low radiation dose enables investigations to be repeated when there is doubt about continuing disease—that is, in patients who complain of abdominal pain but whose laboratory results are unhelpful.

We would accept that there are times when uptake of sucralfate by faecal material may cause confusion; this can usually, although not always, be resolved.

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Leucocytosis induced by exercise

SIR,—Dr D A McCarthy and colleagues (12 September, p 636) draw attention yet again to the phenomenon of exercise induced leucocytosis, first described almost a century ago.[1] Pain, extreme emotion, tachycardia, and convulsions all provoke a similar release of white cells into the circulation.[2] The mechanism, which, as Dr A J Robertson and colleagues point out (3 October, p 856), still requires investigation, probably depends on circulatory changes mediated wholly or in part through catecholamine release. The timing and duration of leucocytosis after exercise seems very variable and has been less fully documented than that after injection of adrenaline, but the biphasic nature of the response is well established[3,4] and the polymorph leucocytosis that persists for some hours after grand mal seizures has been recognised for over 50 years.[2,5] Despite the antiquity of these observations, their inclusion in standard textbooks on haematology,[6,7] and their relevance in many clinical settings, physiological leucocytosis still seems to cause surprise, even consternation, as the following case illustrates.

A 22 year old insulin dependent diabetic in the 35th week of her first pregnancy was admitted to hospital because of hypoglycaemic episodes associated with rapidly falling insulin requirements. At 1 00 am she was seen to have a grand mal seizure. Hypoglycaemia was confirmed by a fingerprick test, and intramuscular glucagon was administered.